L-Isla Local Council

A Sustainable city with an ambition set out to create a Sustainable Community Strategy which will tackle the economic growth of Isla but will not be achieved at the expense of the environment. The ambitions set out in its Sustainable Community Strategy are “Our economic growth will not have been achieved at the expense of the environment – Isla will be a sustainable city with excellent air quality, low waste levels, low carbon emissions and high recycling rates.”

L-Isla targets are to be a sustainable city with excellent air quality, low waste levels, low carbon emissions and high recycling rates. L-Isla Local council has embarked on the Region’s commitment to 10% cuts in their carbon emissions by 2012. The council will commit to a fixed target for emissions cuts, the council will support the locality with the practical guidance and resources they need to achieve those reductions. To improve energy efficiency; developing cost-effective mechanisms to reduce significantly the emissions from our existing housing stock. To help people get out of their cars and travel by other means.

Developing projects to support local, healthy food and to raise the awareness and understanding of sustainability.

For several years, the City of L-Isla worked toward highlighting its historic center and have gained a reputation of intransigence in patrimonial conservation, arguing that, at the risk of disappearing, ancient architectures cannot undergo normalization and technological evolutions without distinction.

To look at backward-looking attitude means not to know the real stakes: the historical, the architectural and urban heritage is by nature a factor of sustainable development. Its preservation and revitalization represent evolution prospect which remain to be explored and worked on.
Both the historic preservation and the sustainable development movements have adopted more holistic approaches over the past decades. In both cases, the focus has turned away from individual buildings and moved instead to entire neighborhoods. So while it is important to consider the energy efficiency improvements that can be made to “listed” or “preservation-worthy” buildings, it is also necessary to discuss broader infrastructural issues. How do you preserve a historic neighborhood while transforming it into a modern sustainable community?

The Covenant of Mayors, of which the locality of Isla is a signatory states that local authorities have a key role in mitigating climate change. 80% of the population lives and works in cities, where up to 80% of energy is consumed. Local governments must therefore become leading actors for implementing sustainable energy policies and ensure that the formal commitment of signatories is translated into concrete measures and projects. Participant localities also committed themselves to allocating sufficient human resources to the tasks, mobilising society in their geographical areas to take part in implementation of the action plan, including organisation of local energy days, and networking with other cities and towns.

The SEAP for Isla will address the key sustainability challenges namely:
Sustainable Energy Action Plans (SEAP)

The SEAP is a key document that shows how the local government will reach its CO$_2$ reduction target by 2020. The SEAP should include actions concerning both the public and private sectors.

In principle, it is anticipated that most SEAPs will include actions in the following sectors:

- Built environment, including new buildings and major refurbishment;
- Municipal infrastructure (district heating, public lighting, smart grids, etc);
- Land use and urban planning;
- Decentralised renewable energy sources;
- Public and private transport policies and urban mobility;
- Citizen and, in general, civil society participation;
- Intelligent energy behaviour by citizens, consumers and businesses.

Reductions of greenhouse gas emissions due to industry delocalisation are explicitly excluded.

Energy efficiency measures, renewable energy projects and other energy-related actions can be introduced in various activity areas of local and regional governments. The Covenant of Mayors concerns the action at local level within the competence of the local governments.

Local governments will be expected to take action in several or all of their possible roles:

- Consumer and service provider;
- Planner, developer and regulator;
- Advisor, motivator and a model; and
- Producer and supplier.

SEAPs should be presented and debated by the civil society. SEAPs with a high degree of citizen participation are the most likely to get continuity in the long-term and to succeed in attaining their objectives.

This would be in line with the commitment of the Isla local council’s commitment to the Covenant of Mayors through the SEAP by concentrating on measures aimed at reducing the CO$_2$ emissions and final energy consumption by end users through actions which will include both the public and the private sector, by showing that the council plays an exemplary role and takes outstanding measures through its own buildings and energy consumption.

Thus one can summarise the main aims of this project and methodology being proposed as follows:
• Reduction on the dependency of the national grid for energy needs—through the installation of Photo Voltaic energy generation systems for the provision of electricity in council offices, public gardens, street lights and other buildings in the locality;

• The reduction of air pollution through improved traffic flow management; Change in the transport system

• Water management studies—due to the fact that the village is in an area which has a substantial flow of runoff rain water, management studies would identify the needs for the improvement and works which need to be commissioned in order to maximise water conservation measures;

• Waste management—improvement in the present waste management practices, encouragement and implementation of further waste management initiatives;

• General sustainability—through studies and various initiatives aimed at creating a holistic sustainable locality;

• Improvement of the quality of life

• making our housing more energy efficient;

• helping organisations cut their carbon emissions;

• reducing dependency on private cars;

• encouraging local food;

• Raising awareness of sustainability.

Creating the right business environment in cities

The council understands the:
• The need to evolve in response to a range of issues like climate change, resource scarcity, population growth and changing lifestyles.
• How can Maltese cities provide the right environment for sustainable enterprise to flourish?
• The council believes that they need to create an environment that will attract the people who are crucial to business success. Businesses look to the public sector to provide incentives, support skills development and create places where their employees want to live.
• Traffic issues are the most prominent frustration with current business locations; but desirable business location will also mean access to a clean, green, and culturally vibrant city centre – enhancing the quality of life for employees and the visitor experience. Highly efficient and flexible ‘green’ premises are also likely to become more important for businesses.

The framework for creating a sustainable business environment:

Proximity to market - Think connectivity, rather than physical distance. Web-enablement, supply chain flexibility including local sourcing, and resilient logistics will all be important issue.

Communications - Think access, rather than movement. Interconnected low-carbon transport, reduced urban sprawl and ICT systems to connect people can support businesses and peoples’ work-life balance.
**Access to resources** - Think lower consumption, and higher quality of life. Regional supply chains and storage for key resources, resource-efficient infrastructure, recovery and recycling will all help cities ride out fluctuations in resource availability.

**Provision of utilities** - Think independent supply streams. Local energy generation, smart metering, smart grid technologies, and closed-loop utility systems, such as heat recycling can reduce a city’s environmental impact and enhance resilience.

**Land/space premises** - Think systematically about the interaction between buildings and the urban infrastructure around them. Urban planning needs to foster climate change adaptation and the provision of flexible, resource and energy efficient workspace.

**Access to talent** - Think about matching green skills to green business needs. A dynamic research sector for green skills, mechanisms for linking talent to ‘green’ jobs, programmes to boost sustainable skills and links to like-minded companies.

**Attractiveness of place** - Think about designing the city for people, not cars. Accessible amenities, attractive, walkable neighbourhoods with integrated business space and improved access to community information can enhance quality of life.

**Government incentives** - Think big AND small: infrastructure investments need to be big, but community planning should be small-scale. Cities need a clear vision of a sustainable future to guide bold investment in infrastructure, whilst fostering local entrepreneurship and innovation at the community scale.

---

**Cultural heritage city development**

The project aim to replace their historical cities into a dynamic of residential attractiveness while preserving the architectural identity of the cultural heritage and historical values. The challenge is to improve quality of life in old centres and to create a comfortable, affordable and sustainable housing seeking out a good balance between preservation requirement and evolution need.

**The main expected outputs of the project are:**
• Develop an approach of the social request in urban housing environment based on city centres' way of life analysis to define these expectations and to answer to them.

• Define the state of the knowledge of the traditional architectures in particular to highlight intrinsic environmental qualities of protected architectural and urban heritage.

• Give an analysis of ancient buildings heritage' situation faced with the different standards.

• Determine energy performances' objectives as well as opportunities for restorations respectful of building heritage and environment.

• Establish an inventory of all the mobilise financial tools allowing eco-restoration.

The Key point of focus

The old European city is already showing some advantages:

• urban density,

• high architectural quality and thrifty constructions in natural resources,

• diversity and proximity of urban functions as well as economical, cultural and educational development potential.

All these assets make it THE sustainable city model. That's why revitalization and valorisation of ancient quarters is the main challenge for sustainable urban development.

Sustainable transport systems

Sustainable transport systems necessarily include several different modes of transportation: public and private motor vehicles and pathways for bicyclists and
pedestrians. Lots of vehicles require lots of space. But as a glance at a map of L-Isla will reveal, European-style historic districts often do not have enough room to accommodate all possible users. In certain parts of its historic center, the streets are not possible to make room for motorists, bus riders, cyclists, and pedestrians in L-Isla narrow streets?

Moving beyond the city center, we can adopt an “adaptive reuse,” that preservationist mainstay, can be invaluable in establishing transportation networks. In the city’s efforts to the council will address the need to search for innovative solutions. Transportation is an interesting issue to consider in this “historic preservation meets sustainable development” discussion because mobility is inherently dynamic.

Proposed project concept: 4th September Square, Isla

The concept of this proposed project is to produce a focal point within the City of Senglea for both the local community and tourists. This area will be produced by changing the use of the existing 4th September square from a bus terminus back to its original purpose of a public square and meeting area. The Square will become an area for community social gatherings and a tourist hotspot complete with WiFi availability. It will become the heart of the city, connecting people with the historical land marks unique to Senglea, such as the Gardjola, Marina, St Julian’s and St Philip’s churches and Boiler Wharf.

To complete this project the statue of the Madonna of the Centre (tac-Centru) will also be restored to its original state. This statue was built in 1816 and bears the coat of arms of Grand Master Wignacourt. The statue was erected in the centre of the city, in Victory Street, as a votive promise made to Our Lady, that the city be not affected by the plague of 1676. When the Sengleans saw that they were surrounded by the plague, they turned to our Lady for salvation, a grace they were bestowed. However, the original features of this statue have been damaged over time and due to the current use of the square as a bus terminus. It is in need of cleaning and restoration.
By making this square a truly public place, it will allow tourists and importantly the residents to appreciate the history of the area and provide a community centre that these residence deserve.

1.1. Baseline Emissions Inventory

The baseline emissions inventory is a compilation of the major energy consumptions in the locality. This includes that due to residential, municipal and commercial consumption as well as public and private transport use and includes the following:

1.1.1. Electricity Consumption
1.1.2. Water Consumption
1.1.3. Public Transport
1.1.4. Private Transport
1.1.5. LPG for heating and cooking
1.1.6. Kerosene Fuel for heating
Consumption Table

<table>
<thead>
<tr>
<th>Category</th>
<th>FINAL ENERGY CONSUMPTION [MWh]</th>
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<tbody>
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<td></td>
<td>Electricity</td>
</tr>
<tr>
<td><strong>BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES:</strong></td>
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</tr>
<tr>
<td>Municipal buildings, equipment/facilities</td>
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<tr>
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<td>Residential buildings</td>
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<tr>
<td>Municipal public lighting</td>
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<td>Industries (excluding industries involved in the EU Emission trading scheme - ETS)</td>
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<tr>
<td><strong>Subtotal buildings, equipments/facilities and industries</strong></td>
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<tr>
<td><strong>TRANSPORT:</strong></td>
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<tr>
<td>Municipal fleet</td>
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<tr>
<td>Public transport</td>
<td>683</td>
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<tr>
<td>Private and commercial transport</td>
<td>583 746</td>
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<tr>
<td><strong>Subtotal transport</strong></td>
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<tr>
<td><strong>Total</strong></td>
<td>7,638 1,266 746</td>
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## Emissions Table

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<th>Diesel</th>
<th>Gasoline</th>
<th>Total</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Municipal buildings, equipment/facilities</td>
<td>24</td>
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<td></td>
<td>24</td>
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<tr>
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<tr>
<td>Residential buildings</td>
<td>5,556</td>
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<td></td>
<td></td>
<td>5,556</td>
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<tr>
<td>Municipal public lighting</td>
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<td></td>
<td></td>
<td></td>
<td>74</td>
</tr>
<tr>
<td>Industries (excluding industries involved in the EU Emission trading scheme - ETS)</td>
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<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td><strong>Subtotal buildings, equipments/facilities and industries</strong></td>
<td>6,708</td>
<td></td>
<td></td>
<td></td>
<td>6,708</td>
</tr>
<tr>
<td><strong>TRANSPORT:</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipal fleet</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Public transport</td>
<td>182</td>
<td></td>
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<td></td>
<td>182</td>
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<tr>
<td>Private and commercial transport</td>
<td>156</td>
<td>186</td>
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<td>341</td>
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<td><strong>Subtotal transport</strong></td>
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<td>6,708</td>
<td>338</td>
<td>186</td>
<td></td>
<td>7,231</td>
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</table>
1.2. Planned Actions and Measures

In view of the review of the environmental management of the locality, a number of observations are made, and where necessary, recommendations for improvements are indicated with priority being given to the cheapest most effective actions. Recommendations for reduction of expenses and emissions resulting from electricity consumption are made to cover each category, highlighting the present practice and suggested improvements.

1.2.1. Plans to reduce Local Council consumption

1.2.1.1. Water consumption at Gardjola Garden and other premises

1.2.1.2. Electricity consumption of Local Council offices and premises (photovoltaic systems, some already implemented)

1.2.1.3. Water consumption reduction by utilising abandoned reservoirs

1.2.2. Plans to reduce Residential consumption

1.2.2.1. Information and education sessions about energy and water savings

1.2.2.2. Logistical and organisational support for collective private investment in renewable energy; solar thermal and photovoltaic systems

1.2.2.3. Logistical and organisational support for collective private investment in water saving systems

1.2.2.4. Voluntary energy audit schemes
1.2.3. Plans to reduce Commercial consumption

1.2.3.1. Information and education sessions about energy savings

1.2.3.2. Logistical and organisational support for private investment in renewable energy; solar thermal, photovoltaic systems and CHP systems

1.2.3.3. Voluntary energy audit schemes

1.2.4. Plans to reduce Public Transport emissions

1.2.4.1. Study regarding the viability of an electric internal taxi service to enable relocation of the bus terminus outside of town

1.2.4.2. Study regarding the long term viability of marine transport, such as the ‘Navebus’ water taxi providing links with other areas in the port, Smart City and Sliema area

1.2.5. Plans to reduce Private Transport emissions

1.2.5.1. Further study regarding pedestrianisation of public zones

1.2.5.2. Study regarding the implementation of web based car sharing systems

1.2.5.3. Study into systems for the encouragement of electric transport systems.

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A DISCUSSION MEETING on
Europe Direct Mosta in collaboration with Dconsulta Ltd, Renergy Ltd and L-Isla Local council organised an information session for the residents of L-Isla on the 22nd of February 2010. The event which attracted a number of women from the locality was opened by the Mayor of L-Isla Joseph Casha, Mark Causon Europe Direct Mosta Manager gave a presentation on the EU sustainability agenda 2020, this was followed by a presentation from Engineer Joseph Fenech who gave an overview of practical means of how to improve and contribute towards attaining a sustainable city. Mr Brian Buhagiar DGT official from the EU Representative office in Malta attended the event.
Mark Causon from Europe Direct Mosta delivering his talk.
Engineer Joseph Fenech from Renergy Ltd explaining some means of reducing our energy needs.
Europe Direct Mosta Malta
8, Floor 2,
Northfields Apartments, Independence Ave.,
Mosta MST9928, Malta
Tel:  +356 2747-4414
Fax:  +356 2540-1308

- Mark Causon Relay Manager

Who are we?

• Europe Direct Information Centre Mosta is operated by the Genista Research Foundation.

• The mission of the network is to distribute information and advice about the European Union's policies.
Who are we?

- With offices all around the 27 countries totalling around 500 offices.
- EUROPE DIRECT information relays act as an interface between EU and its citizens at local level

L-Isla Local Council
Sustainable cities

The ambitions set out in its Sustainable Community Strategy

“Our economic growth will not have been achieved at the expense of the environment – Isla will be a sustainable city with excellent air quality, low waste levels, low carbon emissions and high recycling rates.”

Improvement in quality of life

1. Increase in recycling and household waste collections
2. Change in the transport system

- Making our housing more energy efficient

**key sustainability challenges**
Helping organisations cut their carbon emissions

- To improve energy efficiency
- Developing cost-effective mechanisms to reduce significantly the emissions from our existing housing stock
- To help people get out of their cars and travel by other means
- Developing projects to support local, healthy food
- To raise the awareness and understanding of sustainability
Creating the right business environment in cities

- Need to evolve in response to a range of issues like:
  - Climate change
  - Resource scarcity
  - Population growth
  - Changing lifestyles
  - How can cities provide the right environment for sustainable enterprise to flourish?

They want an environment that will attract the people who are crucial to business success.

Businesses look to the public sector to:

• Provide incentives
• Support skills development
• Create places where their employees want to live
THANK YOU
FOR
YOUR ATTENTION
Mark Causon Europe Direct Manager
Directorate General Communications
European Commission

Energy in Homes
Applications in the Domestic Sector
Ing. Jesmond Camilleri
Ing. Joseph Fenech
Renergy Limited
Overview

1. The rising cost of energy.
2. Ways to measure energy consumption
3. Solutions for energy savings.
4. Solutions to generate your own energy

Oil cost projections (IEA World Energy Outlook 2008)

1. The rising cost of energy
The situation of rising energy costs is a long term trend that all sectors of society must adapt to.

A shift in the way we think about our energy is required:
- The way we consume our energy;
- The way we buy our energy.

In order to facilitate this shift, a methodology to lower energy costs is needed.

The methodology involves three steps:

2. Measure

Energy Savings

Generate Your Own

Measure The Household Consumption

- Collect historical data from W&E bills
- Take note of purchasing of LPG tanks
- Analyse the data to identify trends
Technological Solutions

Solutions for reducing energy costs and improving sustainability can be categorised into three:

- Energy efficiency measures
- On-site generation of energy

3. The Solutions

Lighting

Lighting loads also offer a potential for energy saving measures in various situations:

- Reducing consumption by changing lamps/fittings with more efficient versions
- Implementing building automation to improve efficiency while maintaining a high level of internal comfort
3. The Solutions

Rainwater Harvesting

Harvesting and storage of rainwater to use as first or second class water:

- Reduce water consumption especially during autumn and winter months
- Use excavated underground reservoirs
- Use prefabricated reservoirs

Grey Water Recycling

Grey water is the waste water from sinks, baths and showers.

Recycled grey water can be used as second class water for toilet flushing and some washing applications.
On Site Generation of Energy

An effective method for reducing energy dependency is the on site generation of energy. The technologies available are:

• Solar Heating/Cooling Systems
• Wind Power Systems
• Solar Photovoltaic Systems

3. The Solutions

Solar Heating Systems

Small scale systems for guesthouses normally include a number of thermosyphon systems. Quality is assured by:

• Equipment certified to EU standard EN12976
• Solar Keymark certificate which is the toughest certification in Europe for solar thermal systems.

Small scale system with thermosyphon units
3. The Solutions

Wind Generation Systems

Wind turbines convert the energy in the wind to electricity.
The wind turbine is normally connected directly to the grid.
Wind analysis performed on site to establish potential
If average wind speed is good, planning application is submitted
Installation performed when planning permission is granted

3. The Solutions

Solar Photovoltaic Systems

Being a significant investment, quality in PV system installations is a very important issue. All installation components must be properly matched for operation as a system as well as for compatibility with the local environment.

PV system wind damage due to incorrect mounting.
Reduced Energy Costs

The advantage of reduced energy costs is quite obvious. However, knock on effects include:

• The ability to maintain competitive pricing in an environment where competition is facing increasing energy costs.

Conclusions

• A global situation of rising energy costs necessitates a shift in our perception of energy and its uses.

• The shift to a low energy enterprise should be performed in measurable steps, with energy auditing being commissioned to optimise investments.

• Energy efficiency measures should be implemented starting with the lowest cost options.

• On site energy generation, including solar thermal and PV should be implemented depending on the energy consumption and area available.

• Products, designs and installations should adhere to EU standards for reliability and profitability.

Thank you for your attention
Isla Local Council

Sustainable Energy Action Plan

March 2011
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3. Foreword

The purpose of this report is to provide with an assessment of the energy consumption of the locality, investigate the current uses of energy, and develop a roadmap with recommendations for reduction and optimisation of consumption.
4. Executive Summary

In recent years, it became increasingly evident that enormous changes were occurring in the way in which the world looks at energy consumption and in particular the resulting greenhouse gas emissions and their affect on global warming. In this view
5. Overall Strategy

Overall strategy text

5.1. Objectives and Targets

Objectives and targets text; overall 20% reduction in emissions.

5.2. Current Framework and Future Vision

Explanation of current Direct environmental aspects are defined as being under direct supervision, for example by the municipality, and can be entirely influenced by it. Indirect environmental aspects are related to those activities of the municipal administration that it does not control completely, but that it can influence to a certain extent. Indirect environmental aspects can result from the local administration’s interactions with third parties.

5.3. Organisational and Financial Aspects

5.3.1. Organisational structure and staff assigned

Text to explain suggested staff assignment

5.3.2. Stakeholder and Citizen Involvement

Text to explain involvement of NGOs, local business and citizens’ groups
5.3.3. Financial Sources for Investments

Description of the various funding opportunities for the necessary investments in section 6.
6. Baseline Emissions Inventory

The baseline emissions inventory is a compilation of the major energy flows and the amount of CO₂ emitted due to energy consumption in the locality of Isla during the baseline year 2005, serving thereby as the reference against which the reduction targets and the actual achievements of individual actions and related emission reductions in 2020 shall be monitored and compared.

The baseline year was chosen as it provides the best collection of data relevant for the development of the sustainable energy action plan. Too little data is available for the year 1990 to make a reliable statistical extrapolation of the consumption and emissions data at the period.

The following describes the results of the statistical analysis which have been implemented in accordance with the methodology and the guidelines issued by the Covenant of Mayor Office of the European Commission. Specifically energy production and consumption within the locality of Isla, and related CO₂ emissions are quantified as related to the sectors included in the SEAP, namely the civil (residential and tertiary) sector, public and private transport and water consumption.

The final energy consumption sectors included in the BEI are classified as follows:

- Local council buildings, equipment/facilities;
- Commercial buildings, equipment/facilities;
- residential buildings;
- Street/public lighting falling under the local council;
- public transport;
- private and commercial transport.
6.1. Methodology

There is no regular data gathering exercise in the Maltese islands to estimate emissions by locality as this was never the remit of local councils. The available data is sparse and has to be extrapolated and estimates derived accordingly. The year 2005 provided the best available set of data, including traffic counts for transport emissions and a good value of the average stack emissions per kWh from Enemalta Corporation. The total values for each consumption category was obtained from available national statistics and data provided by the Local Council, Enemalta Corporation and Water Services Corporation. Equivalent CO\textsubscript{2} emissions were calculated using standard emission factors in line with the IPCC principles.

6.2. Locality Energy Consumption

The locality of Isla is primarily a residential area located on a peninsula surrounded by medieval fortifications. It is located in the main commercial port and is flanked by a ship repair yard on one side and a yacht marina on the other. The main commercial area is along the shoreline facing the marina, where there are a number of restaurants and bars. The commercial energy consumption will exclude the consumption of industrial establishments such as the shipyard, and will focus on the small commercial enterprises in the locality. The energy consumption of residential units is primarily electricity consumption by households and a small quantity of LPG, mainly for cooking and space heating.

The commercial activities in the locality are mainly retail and restaurants, with also a small of centres run by NGOs and the Church. The consumption of the commercial sector is also mainly electrical, with some LPG for cooking and space heating. Other fossil fuels such as kerosene are also used in some cases for space heating.
Since water in Malta is partly produced by the Reverse Osmosis process, a significant energy use results from water consumption. For the purpose of the SEAP, the water consumption of each sector was represented as the required electricity consumption to produce the water consumed.
6.2.1. Electricity and Water Consumption

Electricity and water consumption were calculated as a total value in the BEI for each sector. The local council takes care of the consumption of three locations; the local council office premises, Gardjola Garden, and St. Anne’s Arch. The consumption of these three locations is small and it amounts to less than 1% of the total locality energy consumption. The major consumption is in the residential sector, with 5,148MWh of energy consumed in the form of water and electricity in the baseline year. Enemalta Corporation reported that in 2005, 0.8782kg of CO$_2$ were emitted at the power stations for every kWh of electrical energy produced. This means that the residential sector caused 4,521 tonnes of CO$_2$ emissions from the power plant stacks in the baseline year, representing 85% of the total emissions in the locality. There are significant opportunities to reduce the energy intensity in the residential sector, even with increased standards of living, and these are outlined in the Planned Actions and Measures.
The table above shows the projected emissions due to electricity and water consumption in the locality. The projection in the BAU scenario shows the increase in consumption and emission expected due to population growth and increased energy intensity in the residential and commercial sectors. The SEAP scenario represents a 30% effective reduction over the baseline year when the proposed measures are taken into account.
6.2.2. Public Lighting

Although street lighting devolution had already been implemented in 2005, the billing is still not in the hands of the local council. However, it was considered important to include this sector in the BEI as there are some important gains that can be made as part of the SEAP. The public lighting is composed of mainly wall bracket mounted luminaries with sodium vapour lamps, most of which are 70W type with small quantities of 150W and 250W lamps. Public lighting in the playing field, church square and other public spaces is provided by HIT (metal halide) lamps, providing higher CRI light and therefore better light quality. In 2005, 84MWh of energy were consumed to provide street and public lighting in the locality, resulting in 74 tonnes of CO₂ emissions and 1% of the total consumption and emissions of the locality.

There are a number of measures which can be taken to reduce the emissions and improve the energy efficiency of the locality street lighting. Improved design and placement, more efficient luminaries and lamps, and the possibility of dimming are proposed to reduce the consumption of street lighting by 30% until 2020. The table above compares the BAU scenario with the SEAP scenario. The ‘relamping on failure’ policy and maintenance regimes result in reduced lighting levels and increase the need for new luminaries in the locality.
6.2.3. Public Transport

Public transport in Isla is currently being provided by the national service operated by the Public Transport Association. The primary route is numbered 3 and provides service also to Marsa, Paola and Cospicua. The other bus route providing service is numbered 300, which passes through Isla to provide the Mater Dei Hospital/University service. The energy consumption of the public transport system results from the consumption of diesel fuel in the bus fleet. The average mileage of each route through Isla and the average diesel consumption per kilometre was considered to obtain the value of energy consumption due to public transport in the locality. The emissions factor from the standard emission factors in line with the IPCC principles was used to obtain the emissions due to public transport.

As seen from the charts, public transport results in a small proportion of the total energy consumption (and emissions) of the locality. Moreover, since the public transport system is under reform, routes and vehicles are expected to change, and recalculation would be necessary under the SEAP guidelines once the new system is in place.
6.2.4. Private Transport

Private transport is an indirect environmental aspect; it is an activity which municipal administration does not control completely, but that it can influence to a certain extent through its interaction with third parties, other authorities and organisations.

Isla is an enclosed town and has a single major entry and exit point through St. Anne’s Arch but vehicles can also enter Isla by driving along the coast on the Marina side. The absolute majority of the transit inside the locality is due to vehicles arriving and departing from the town and there is very little intercity transit.

The values for private transport consumption were estimated using figures provided by NSO for vehicle ownership in the town. An average mileage through the town was estimated and this provided the total mileage travelled through the town per annum. It was assumed that all commercial vehicles operated on diesel fuel while a mix of diesel and gasoline is used for other private vehicles. In 2005, it is estimated that 1,054MWh of energy were consumed by private transport in Isla, resulting in 271 tonnes of CO₂ emissions. As seen in the charts, this represents 12% of the total locality energy consumption and 5% of the emissions.
6.2.5. LPG Consumption

As no national or regional gas distribution networks exist, the primary source of gas for cooking and heating is LPG (liquefied petroleum gas), mostly a mixture of propane and butane gases. It is available and mostly used in refillable cylinders of 10kg to 20kg, both in the residential and commercial sectors. Large consumers and installations which use the gas for space heating purposes may have a fixed bulk LPG tank installed and these are refilled by an appropriate road tanker.

The LPG consumption was estimated using consumption figures from NSO and Enemalta. In 2005, 1,809MWh of LPG were consumed in the locality, resulting in 373 metric tonnes of CO₂ emissions.

6.2.6. Other fuel sources

Although in recent years, other fuel sources may have become less viable, there still exist some heating systems running on kerosene and heating diesel. Moreover, in the last ten years, fireplaces running on biomass (firewood and pellets) have become more popular and several installations are seen operating. Since there is no national scheme to track the source of biomass fuels, these cannot be classified as renewable heating sources and have been included in the category of fossil fuel sources.

An estimate for the use of other fossil fuels was made using NSO and Enemalta data for Kerosene and estimates on residential use were extrapolated to 2005. This resulted in the consumption of 48MWh of other fossil fuels in the locality, resulting in 13 metric tonnes of CO₂ emissions.
6.2.7. Total Emissions and Projections

Due to population growth and growing standard of living, energy consumption is projected to increase as shown in the business as usual (BAU) scenario. The SEAP proposes a number of measures to decrease emissions to 20% below the baseline 2005 figure of 5,735 metric tonnes of CO₂ per annum and the decrease is shown compared to the BAU scenario in the table below. The BEI tables are provided in the Annexes to this document.
Isla LC SEAP
March 2011

Locality Emissions

Residential buildings: 85%
Private and commercial transport: 5%
Tertiary (non-municipal) buildings, equipment/facilities: 8%
Municipal buildings, equipment/facilities: 0%
Public transport: 1%
Municipal public lighting: 1%
7. **Planned Actions and Measures**

In view of the review of the energy consumption and respective emissions of the locality, a number of observations are made, and where necessary, recommendations for improvements are indicated with priority being given to the cheapest most effective actions. Recommendations for reduction of energy consumption and emissions are made to cover each category, highlighting the present practice and suggested improvements.

**7.1. Plans to reduce Local Council consumption**

**7.1.1. Water and Electricity Consumption at Local Council Premises**

To provide guidance and set the ball rolling, it is imperative that the local council premises are made into a showcase of the principle of the sustainable energy action plan. It is proposed that the local council offices, playing field and Gardjola Gardens be managed as ‘Zero Energy Buildings’. The local council has already started with the implementation of a grid connected photovoltaic system on the roof of its offices. This is providing a significant part of its electricity needs. Moreover, there are plans to implement an additional grid connected PV system to generate the energy needed by the new floodlighting on the locality’s bastions. In the meantime, a number of measures will target the reduced energy consumption of the local council:

- Energy audit of the local council offices
- Implementation of energy efficiency measures as outlined in the energy audit, typically;
  - Energy efficient lighting
  - Energy efficient air conditioning
• Building automation to control HVAC, lighting and IT systems
• Energy efficient IT systems
• Installation of renewable energy systems as applicable, such as a grid connected PV systems in the garden and playing field.

Any measure implemented, especially in the garden will need to target also the overall architectural value of the project such that building integration and the achievement of a high aesthetic value are given due importance. Any renewable energy and shading devices for energy efficiency must effortlessly blend into the building fabric so that the building becomes a benchmark for energy efficient building.
7.1.2. Water consumption reduction by utilising abandoned reservoirs

A number of abandoned underground reservoirs are present in the locality, primarily close to the primary school and another close to Gardjola Garden. These have the ability to store large quantities of rainwater which can be used for municipal purposes such as irrigation of public spaces as well as for use by NGOs, and private citizens. It is recommended that a survey of the available reservoirs be made and a committee is set up, made up of potential users and a representative of the local council, to take care of the refurbishment and management of the reservoirs. A quick estimate of the available potential storage volume of rainwater stands at approximately $700\text{m}^3$, which has the potential to save up to $1,000\text{m}^3$ per annum. This will displace the consumption of over $5\text{MWh}$ per annum and reduce emissions by $4.5$ metric tonnes per annum.
7.1.3. Plans to reduce the energy consumption of Public Lighting

As discussed in 5.22, the energy consumption of street lighting is not strictly within the local council’s remit, however, it is still a target of the local council to reduce the consumption of the street lighting infrastructure whenever this is handed over. The measures recommended for this purpose are three:

- Improve the design and placement of street lighting luminaries to optimise the use of the available spaces and reduce wasted light. This will allow either to improve light distribution without increasing the lighting power or to reduce the number of lamps and keep the lighting levels as required.

- Replace inefficient luminaries and lamps with more efficient models. Ideally, luminaries chosen should also be able to communicate using a given protocol to enable dimming in the future without luminaire replacement. Low pressure sodium vapour lamps will currently provide the best efficacy, sacrificing the CRI (Colour Rendering Index). To achieve a good CRI while keeping efficacy as high as possible, Metal Halide or LED technology are the best options. Ideally, one should wait for further developments in the field of LED to make the best of recent improvements in lamp efficacy and optimise costs.

- Implement an efficient street lighting dimming system to reduce the power consumption and lighting levels during periods where the illuminance required is lower, such as the small hours. This will significantly reduce the energy consumption of the street lighting infrastructure. Moreover, the associated communications system can also be used to report lamp and luminaire failure, thus improving the maintenance services and providing better, more consistent light.

A realistic target for these three steps would be a reduction of 30% of current consumption by 2020 in three year steps. This is show in the chart below, where a comparison is made with a BAU scenario.
7.2. Plans to reduce Residential consumption

As seen in the chart detailing the division of emissions by sector, the emissions caused by consumption in residential buildings is the most significant, resulting in 74% of the total emissions in the locality. In this respect, a focus on the solutions available to reduce the energy and water consumption in the residential sector is important if the targets are to be reached.
7.2.1. Information and education sessions about energy and water savings

Education and awareness raising are the basis of building up support and consensus, therefore, a concerted educational campaign aimed at raising awareness about the local council’s sustainable energy action plan in the locality is recommended. This will ensure that the residents are on board with the plan and are kept well informed of developments in the various initiatives that are proposed. This can be done in a number of ways:

- Inclusion of regular information about developments related to the SEAP in the local council’s newsletter
- A series of information sessions targeting different interest groups such as children, young adults, parents and pensioners. These information sessions should focus on a simple procedure to implement energy savings in the home, starting with the basics of measuring and recording consumption and discussing the available technologies for energy savings.
- Preparation of a leaflet, possibly with the support of local experts and NGOs, for distribution in households, explaining the basics of energy saving techniques and how to ‘do it yourself’.

Follow up sessions and sessions with NGOs should also be considered so that people have the chance to clear their doubts and make sure their efforts are taking them on the right track.
7.2.2. Installation of renewable energy systems: Solar Water Heaters and Grid Connected Photovoltaic Systems

A cornerstone of the plan to reduce emissions in the locality is the implementation of a long term plan to improve the penetration of solar water heating and photovoltaic systems. In the absence of a high return feed in tariff, such a plan would require significant investment, but there are a number of models which have been implemented with various degrees of success. One such model is the Fraser Coast 1000 Solar Roofs Challenge, implemented in South Queensland, Australia, where every homeowner in the locality is encouraged to implement solar heating and photovoltaic systems with various financing options, assisted by the municipal authority’s environmental board and a number of private companies.

The SEAP for Isla requires the installation of approximately 300 solar thermal and photovoltaic systems over the period till 2020. Each solar thermal system is estimated to displace over 1MWh of electricity or LPG consumption while each photovoltaic installation is estimated to generate 1.55MWh per annum per kWp installed. A typical residential system would be around 1.4kWp in size and most roofs will have space for both systems.
7.2.3. Logistical and organisational support for collective private investment in renewable energy; solar thermal and photovoltaic systems

The most common building form in Isla is the residential block, with multiple flats on each floor. This building format results in an increased building density and reduced ownership of the roof. In such an environment, the typical home owner will have limited access to roof area which will have to be shared by a larger number of users. This situation leads to difficulties in the implementation of renewable energy systems such as solar water heaters and photovoltaic systems. These difficulties have already been faced by multi ownership housing schemes in other EU countries such as Italy and Germany and various solutions exist to enable the optimisation of the available roof area.

It is proposed that a study is set up to develop a practical solution for the local implementation of shared ownership schemes. This study should analyse the legal framework regulating the shared use of common parts of the building and come up with a practical solution related to the implementation of renewable energy systems. The resulting technique should be made available to the public through the awareness raising and education sessions so that the implementation of solar water heating and photovoltaic systems is facilitated even in difficult situations.
7.2.4. Logistical and organisational support for collective private investment in water saving systems

The same logic as for renewable energy systems should be applied to water saving systems. Enabling shared ownership schemes for water saving systems would enable projects such as:

- The collective refurbishment and use of large reservoirs by groups of private individuals
- Collective investment in shared ownership housing in water saving measures such as rainwater capture and storage, and grey water recycling.

7.2.5. Voluntary energy audit schemes

In conjunction with education and information dissemination, the provision of an energy auditor free of charge or at a nominal fee for residents would enhance and consolidate the energy savings that individuals can achieve at low cost in the home. Models for such a scheme exist in various EU countries, such as the RE.NEW (previously known as Green Homes Concierge Service) scheme in London. This will require investment in a number of trained energy auditors so that on site assistance to homeowners empowers them to implement simple energy saving decisions, such as replacement of inefficient appliances and advice about renewable energy systems.
7.3. Plans to reduce Commercial consumption

7.3.1. Information and education sessions about energy savings

Using the same logic as for the residential sector, an educational campaign targeted at the various different sectors would greatly enhance the ability of the commercial sector to implement energy savings. This should be implemented in conjunction with voluntary energy audit schemes where in the commercial sector, it could be more effective to target large consumers individually so that better results are obtained.

7.3.2. Logistical and organisational support for private investment in renewable energy; solar thermal, photovoltaic systems and CHP systems

The voluntary energy auditing scheme for the commercial sector should ensure that proper support is provided to consumers where renewable energy and CHP systems are viable to install. These individual cases will result in significant energy savings which will affect the targets of the whole locality, since the consumption of large commercial establishments is much higher than residential installations.

7.4. Plans to reduce Public Transport emissions

Public transport emissions have been estimated using the current system, which is due to be reformed in a few months. The new system will include vehicles compliant with stricter emissions standards as well as more fuel efficient engines. This will probably result in a reduction of emissions with respect to the 2005 baseline scenario and a recalculation will be necessary once the reform is fully in place.
7.4.1.1.  Study regarding the viability of an electric internal taxi service to enable relocation of the bus terminus outside of town

Notwithstanding the ongoing reform of the public transport sector, and the lack of influence of the local council on public transport management, it is recommended that a study is commissioned to investigate the viability of moving the bus terminus from the centre of the locality to the outside. To avoid the additional inconvenience of having the bus terminus a long walking distance from the town, a shuttle service between the town centre and the bus terminus may be provided. This is ideally done using an electric vehicle to reduce emissions inside the town perimeter while providing quieter operation. The vehicle should be small enough to navigate the narrow roads inside the locality so that the service provided can accommodate elderly persons closer to their homes on request.

The study should outline funding options and approximate capital and operating costs so that the viability can be determined with funding options in view.

7.4.2.  Study regarding the long term viability of marine transport

The locality of Isla is located on a peninsula, and this gives it easy access to the sea shore on all sides. The locality also has good quay facilities and can accommodate various forms of marine transport. The only form of marine transport currently in use is the use of traditional boats to ferry tourists between Valletta and the Three Cities, but there is no concerted effort to provide a viable alternative to land based transport.

A study should be commissioned to outline the viability of a marine transport option between Isla and the other nearby cities, such as Birgu, Bormla, Valletta and the new development in Smart City. Such a system is already in place in various coastal cities in the EU, such as Genoa in Italy where the Navebus system is in place. This will provide a lower emissions option to land based transport.
7.5. Plans to reduce Private Transport emissions

Although private transport is considered an indirect environmental aspect which the council has limited influence in, there are a number of possibilities where the local council can achieve a reduction of emissions in this sector. The projected reductions are relatively small, but despite the small volume of traffic passing through the locality, these small reductions will result in significant improvements in the quality of life for citizens.
The chart above compares the SEAP scenario with the BAU scenario, where emissions keep rising with the rising vehicle population. The SEAP enables a slight reduction in emissions through a number of measures.

7.5.1. Study regarding the implementation of web based car sharing systems

Car sharing schemes are often hampered by a lack of information and regularity of usage which often causes the ultimate abandonment of the schemes. Web based online car sharing schemes are an interesting development and are already in use in the UK in places such as Bristol and Central Scotland (Tactran Lift Sharing Scheme).

A study into the possibility of implementing such a scheme in the locality would have great potential to reduce traffic and associated emissions.

7.5.2. Study into systems for the encouragement of electric transport systems.

The economics of renewables create an extraordinary opportunity for transportation. But the economics of transportation also create an extraordinary opportunity for renewables. A transition from our current system – in which 98% of transportation is powered by oil products – to an electric transportation system based on renewables, would benefit both renewable energy and transportation.

First, an electric vehicle (EV) system can take advantage of underutilized electricity, reducing oil consumption and providing resources for renewable development. Second, EVs can alleviate the problems of intermittency, unpredictability and off-peak generation that have hindered the progress of renewable energy in the past. Third, because EVs offer energy efficiency up to three times greater than that of gasoline-powered vehicles, EVs reduce the overall burden on energy resources.
The zero tailpipe emissions of EVs also result in a greatly improved air quality, with all the associated health and environmental benefits. A study into possible schemes for the encouragement of electric vehicles would outline a set of benefit driven opportunities and best methods for taking advantage of the opportunities in the local context. Such encouragement schemes may be related to parking and the availability of charging stations.
8. Conclusions
9. Annex A: Baseline Emissions Inventory Table
10. Annex B: Sustainable Energy Action Plan Table

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**Documents attached:**

- Sustainable Energy Action Plan full report
- Poster for SEAP meeting
- 4th September proposal
- Proposed square layout
- Alternative energy proposal